DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 31, 2009 has been entered. Claims 1, 5 and 10 were amended.

3. The text of those sections of Title 35, U.S.C. code was not included in this action can be found in the prior Office action issued on March 19, 2009.

Claim Rejections - 35 USC § 103

4. Claims 1, 4, 5 and 10 are rejected 35 U.S.C. 35 103(a) as being unpatentable over Maeda in view of Langan (U.S. Patent No. 4,913,988).

Regarding claim 1, Maeda teaches a lithium non-aqueous electrolyte secondary cell comprising a cathode active material, comprising cobalt oxide particles surface-coated with magnesium hydroxide. Maeda further discloses that the composition of the magnesium hydroxide has a BET specific area value of 0.5 to 50 m^2/g (see col. 2, lines 19-31 and col. 3, lines 7-17). Maeda further teaches a conductive agent and a binder (see col. 9, lines 53-59).

Maeda does not specifically teach that the metal hydroxide is present in an amount of greater than 0 weight percent and less than 10 weight percent.

However, Langan teaches that the cathodic material additive can be made of alkaline earth metal hydroxides to improve the cell performance. Langman further teaches that calcium hydroxide can be used to improve closed circuit voltage retention after storage at elevated temperatures and is mixed into the cathode material at a weight percent preferably of 1.3% (see col. 2, line 22- col. 3, line 1).

Therefore, it would have been obvious to one with ordinary skill in the art to incorporate a metal hydroxide with a weight percent of 1.3% in a lithium ion secondary battery to improve the closed circuit voltage retention after storage at elevated temperatures.

It is noted that claims 1 and 5 are product-by process claims. "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F. 2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Since Maeda's actual cathode active material and metal hydroxide are similar to that of Applicant's, Applicant's process is not given patenable weigh to the claim.

Regarding claim 4, Maeda teaches a lithium non-aqueous electrolyte secondary cell consisting of a magnesium hydroxide for the cathode active material (see col. 3, lines 7-17).

Regarding claim 5, Maeda teaches a non-aqueous electrolyte secondary cell (lithium ion battery) comprising a cathode, an anode, a non-aqueous electrolyte, a conductive agent and a binder (see col. 2, lines 19-31 and col.9, lines 53-67). Maeda further discloses that the composition of the magnesium hydroxide has a BET specific area value of 0.5 to 50 m^2/g (see col. 3, lines 7-17).

Maeda does not specifically teach that the metal hydroxide particles, binder and conductive agent are present in an amount of greater than 0 weight % and less than 10 weight %.

However, Langman teaches that the cathodic material additive can be made of alkaline earth metal hydroxides to improve the cell performance. Langman further teaches that calcium hydroxide can be used to improve closed circuit voltage retention after storage at elevated temperatures and is mixed into the cathode material at a weight percent preferably of 1.3% (see col. 2, line 22- col. 3, line 1). Langman also teaches that the binder can comprise 1 to 10 weight percent and the conductive material preferably comprises 3 to about 10 weight percent of the cathode mix (see col. 4, lines 29-36).

Therefore, it would have been obvious to one with ordinary skill in the art to incorporate a metal hydroxide, binder and conductive agent with a weight percent in the

range of 0-10 weight percent in a lithium ion secondary battery to improve the closed circuit voltage retention after storage at elevated temperatures.

Regarding claim 10, Maeda teaches a lithium non-aqueous electrolyte secondary cell consisting of a magnesium hydroxide for the cathode active material (see col. 3, lines 7-17).

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda in view of Langan as applied to claims 1, 4, 5 and 10 above, and in further view of Hibara (JP 2002-8718).

Regarding claim 6, Maeda and Langan do not teach that the electrolyte comprises at least one additive selected from the group consisting of the compounds represented by the following formula 1-4: wherein, each of the R_1 and R_2 is independently selected from the group consisting of H, a C_1-C_5 alkyl group, a halogen atom, and a phenyl group and a phenoxy group non-substituted with a C_1-C_5 alkyl group or a halogen atom (formulae 1, 3, and 4); and R is C_1-C_5 alkenyl group or a C_1-C_5 alkyl group (formula 2).

However, Hibara teaches a non-aqueous electrolyte secondary battery, wherein the electrolyte comprises the following additives and each R_{11} and R_{12} is independently selected from the group consisting of H or a C_1-C_5 alkyl group (see paragraph 0031 claim 5, formula 4b). This is used as an additive to be added to the secondary battery electrolyte to improve the charge and discharge characteristics (see paragraph 0001). The combination of familiar elements is likely to be obvious when it does no more than

yield predictable results. See *KSR Int'l v. Teleflex Inc.*, 127 Sup. Ct. 1727, 1742, 82 USPQ2d 1385, 1397 (2007) (see MPEP § 2143).

Therefore, it would be obvious to one with ordinary skill in the art to combine the lithium ion battery to use the above electrolytes to improve the charge and discharge characteristics of the battery.

6. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda in view of Langan in view of Hibara as applied to claim 6 above, and further and in further view of Unoki et al. (JP 2002-083632) (hereinafter "Unoki").

Regarding claim 7, Maeda, Langan and Hibara, teach all of the positively recited elements of claim 6. Maeda, Langan and Hibara do not teach the specific additives for the formulas 1-4.

However, Hibara teaches that the additive for formula one can be VC (vinylene carbonate) (see paragraphs 0031-0033).

Unoki teaches that the electrolyte for the secondary battery for formulas 2-4 uses the additive propane sultone (PS) for high temperature preservation of a cell and cycle characteristics (see paragraphs 0001 and 0008-0011). The combination of familiar elements is likely to be obvious when it does no more than yield predictable results. See *KSR Int'l v. Teleflex Inc.*, 127 Sup. Ct. 1727, 1742, 82 USPQ2d 1385, 1397 (2007) (see MPEP § 2143). Therefore, it would be obvious to one with ordinary skill in the art to combine these additives to the lithium battery to improve the high temperature preservation of a cell and the cycle characteristics of the battery.

Response to Arguments

7. Applicant's arguments filed on December 31, 2009 have been fully considered but they are not persuasive.

Applicant's principal arguments is

(a) that the cathode active material particles and the metal hydroxide particles in the cathode are not uniformly mixed with each other.

In response to Applicant's arguments, please consider the following comment.

(a) Maeda teaches that the magnesium hydroxide coats the entire cobalt oxide particle, therefore the specific surface area that is stated would be the specific surface area of the metal hydroxide since it is on the surface of the particle. Therefore, it is considered to be uniformly mixed together within the active material.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PATRICIA DAVIS whose telephone number is (571)270-7868. The examiner can normally be reached on 7:30am-5pm EST. Monday-Friday, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Examiner, Art Unit 1795

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